

driving the tuning mirror 14 are described in U.S. Patent Application Serial No. 10/027,210 filed simultaneously with this application and incorporated by reference herein. For example, FIG. 10A shows a desired Gaussian spectrum with FWHM of 3.3 pm and a simulated fit for a 30-pulse window of pulses having a FWHM of 0.8 pm. FIG. 10B shows a proposed sequence of pulses for the 30-pulse window in which the center line wavelength follows a generally sine pattern. FIG. 10C compares the frequency content of a smooth wavelength sequence such as the FIG. 10B with a random sequence. FIGS. 10D and 10E show the effect of 133 Hz sine pattern and a 30-pulse window and a 40 Hz sine with a 100-pulse window. FIGS. 10F and 10G show how to produce a flat-top spectrum.

The reader should understand that rapid changes in mirror position result in substantial non-linearities. One solution could be to synchronize mirror motion with pulse repetition rate such as shown in FIG. 10H and FIG. 10I.

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While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects. For example, partially line narrowed lasers where the bandwidth is line narrowed with a plurality of prisms and the beam is reflected with a tuning mirror. This technique would involve dithering the tuning mirror. The peak separation could vary from the examples shown. Normally, however, the peaks would be offset by at least 0.5 pm. In lithography, bursts of pulses normally contain about 20 to 400 pulses. Most lithography units now operate at 1000 Hz or greater. It should also be recognized that these dithering techniques helps to eliminate coherence problems. Instead of dithering the mirror to increase the effective bandwidth, the grating could be dithered with a dither pattern chosen to produce an effective larger bandwidth or desired effective spectrum. Therefore, the appended